

```
#####
#
# MAIN
#
main <- function(class, system, level, num, den)
{
  #
  num1 <- NULL; den1 <- NULL
  #
  for(k in 1: length(num))
  {
    if (system == 1) {num1 <- c(num1, c(num[k], num[k]+den[k]))
                      den1 <- c(den1, c(num[k]+den[k], den[k]))}
    #
    if (system == 2) {num1 <- c(num1, c(den[k], num[k]+den[k]))
                      den1 <- c(den1, c(num[k]+den[k], num[k]))}
    #
    if (system == 3) {num1 <- c(num1, c(num[k], num[k]+den[k]))
                      den1 <- c(den1, c(num[k]+den[k], num[k]))}
    #
    if (system == 4) {num1 <- c(num1, c(den[k], num[k]+den[k]))
                      den1 <- c(den1, c(num[k]+den[k], den[k]))}
  }
  #
  # Recursion
  #
  level <- level-1
  if(level != 0) main(class, system, level, num1, den1)
  else c(num1,den1)
  #
}
#
#####
#
sequencebuilding <- function(class, system, maxlevel, num, den)
{
  #
  numblock <- num
  denblock <- den
  #
  for(level in 1:maxlevel)
  {
    block <- main(class, system, level, num, den)
    numblock <- c(numblock, block[1 : (length(block)/2)])
    denblock <- c(denblock, block[(length(block)/2 +1):length(block)])
  }
  #
  return(list(numerator = numblock,
             denominator = denblock,
             sum.numerator.denominator = numblock + denblock))
  #
}
#
#####
#
# Examples: Build the beginning of all four systems
#
sequencebuilding(class=1, system=1, maxlevel=5, num=1, den=1)
sequencebuilding(class=1, system=2, maxlevel=5, num=1, den=1)
sequencebuilding(class=1, system=3, maxlevel=5, num=1, den=1)
sequencebuilding(class=1, system=4, maxlevel=5, num=1, den=1)
#
#####
```